System Wide Information Management

SWIM Program Overview

Presented to: SWIM-SUIT User Forum

Date: June 24, 2010

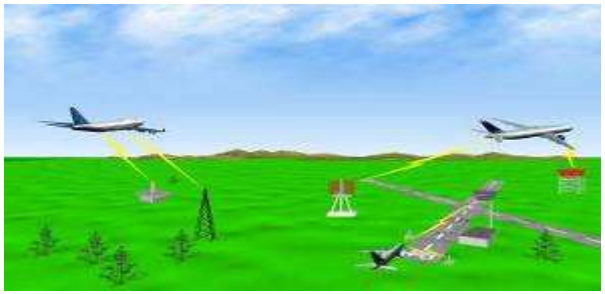
Federal Aviation Administration

Agenda

- NextGen Overview
- SWIM Program Overview and Status
- SWIM Segment 2 and Next Steps
- SWIM/SWIM-SUIT Interoperability demonstration

NextGen: *Delivering safety, capacity, efficiency & environmental stewardship*

Today's National Airspace System		NextGen
Ground-based Navigation and Surveillance	→	Satellite-based Navigation and Surveillance
Air Traffic Control Communications By Voice	→	Routine Information Sent Digitally
Disconnected Information Systems	→	Information More Readily Accessible
Cognitive-Based Air Traffic "Control"	→	Decision Support Tools
Fragmented Weather Forecasting	→	Forecasts Embedded into Decisions
Airport Operations Limited By Visibility Conditions	→	Operations Continue Into Lower Visibility Conditions
Forensic Safety Systems	→	Prognostic Safety Systems
Focus on major airports	→	Focus on metropolitan areas
Inefficient routes & fuel consumption	→	Shorter flight paths/ fuel saving procedures; alternative fuels; reduced noise



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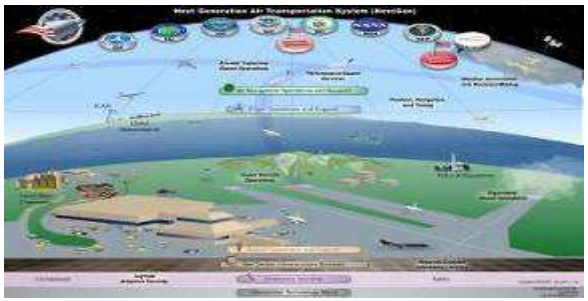
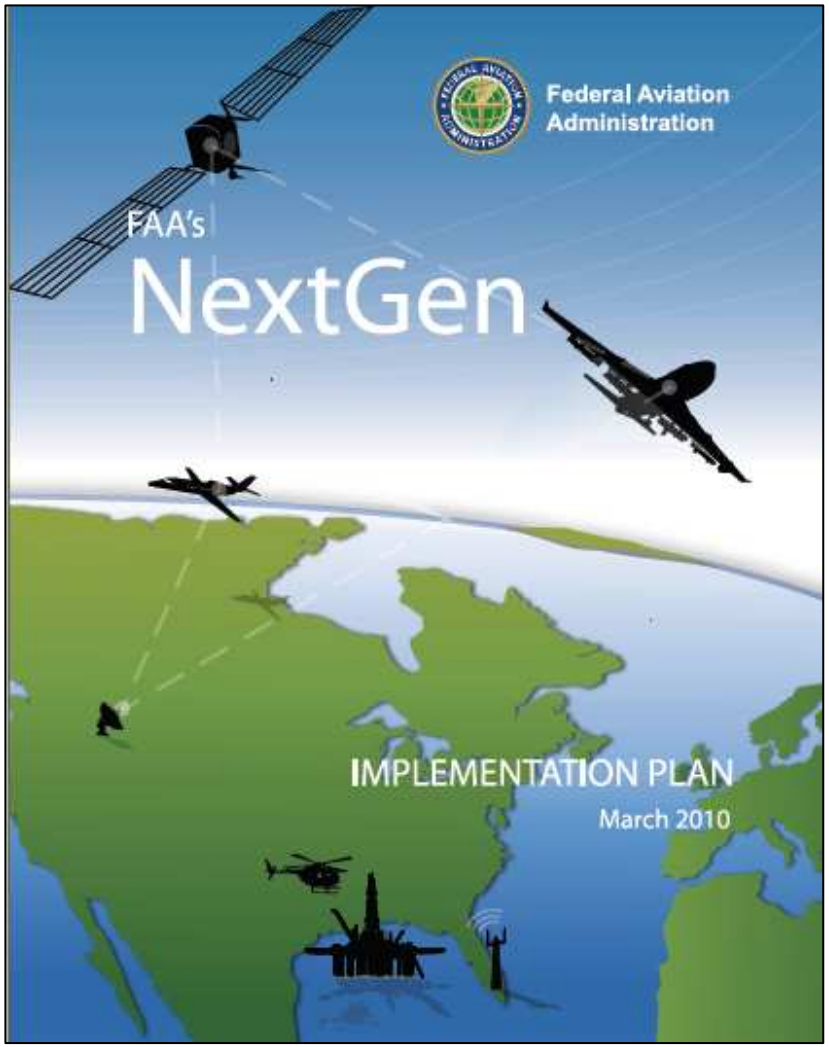


NextGen Implementation Plan



FY10 NextGen Transformational Programs

- System-Wide Information Management (SWIM)
- Automatic Dependent Surveillance – Broadcast (ADS-B)
- Data Communications (Data Comm)
- NextGen Network-Enabled Weather (NNEW)
- NAS Voice Switch (NVS)
- Collaborative Air Traffic Management Technologies (CATMT)

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SWIM and the Evolution of Air Transportation

SWIM supports FAA's long-term goals for the Next Generation Air Transportation System to:

- Allow more aircraft to fly more closely together on more direct routes
- Reduce delays and congestion
- Provide benefits for the environment and the economy through reductions in carbon emissions, fuel consumption, and noise

Specifically, SWIM will support these goals by:

- Providing data and services to support better real-time planning
- Streamlining communications
- Connecting more FAA systems to more customers

Program Concept

SWIM is an IT infrastructure program that will operate in the background to provide data to authorized users

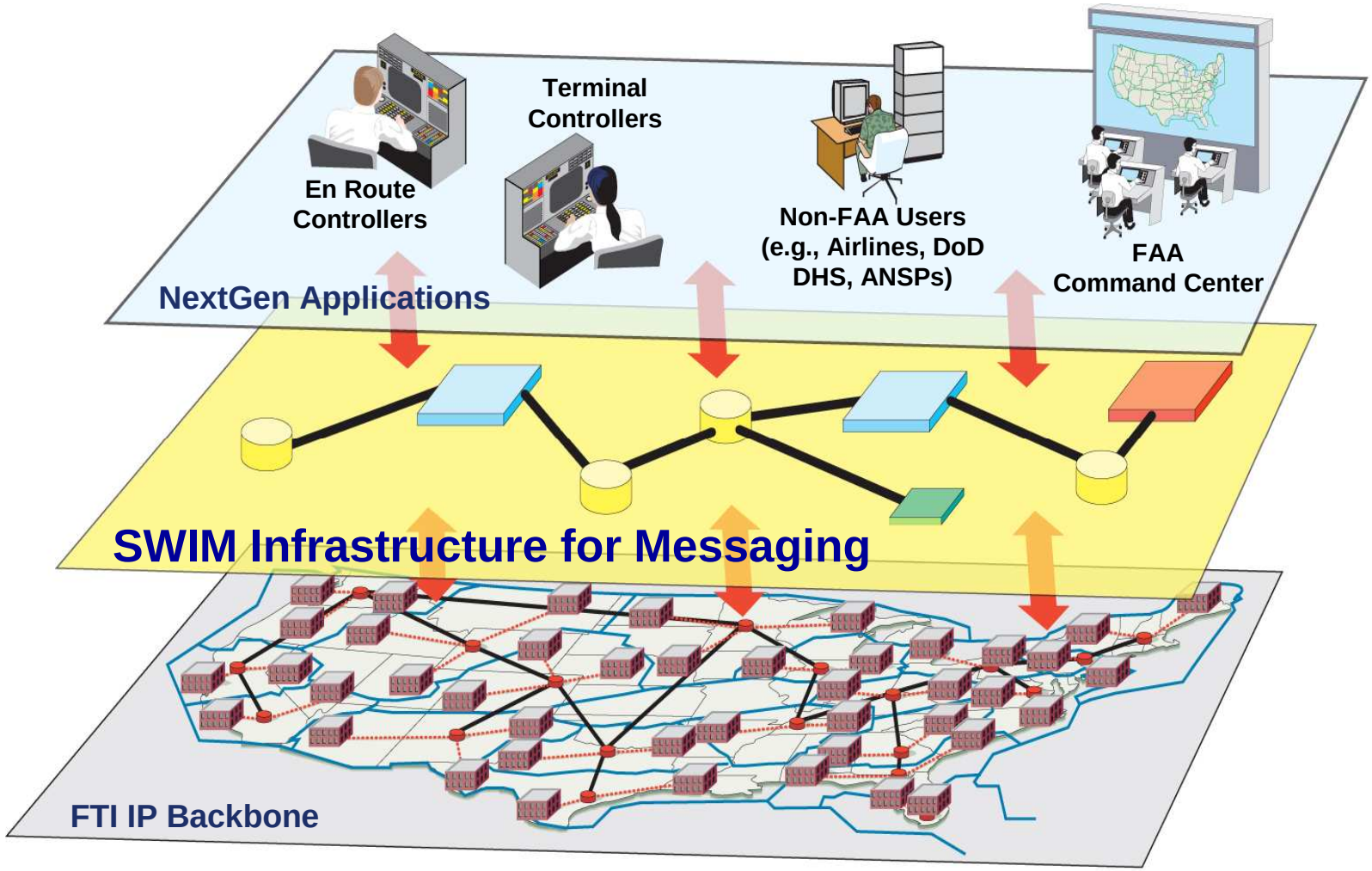
SWIM will:

- Implement a Service-Oriented Architecture (SOA) in the National Airspace System (NAS)
- Allow the FAA to create new system interfaces more quickly and more cheaply than is possible today
- Facilitate the increased data-sharing that is required for NextGen

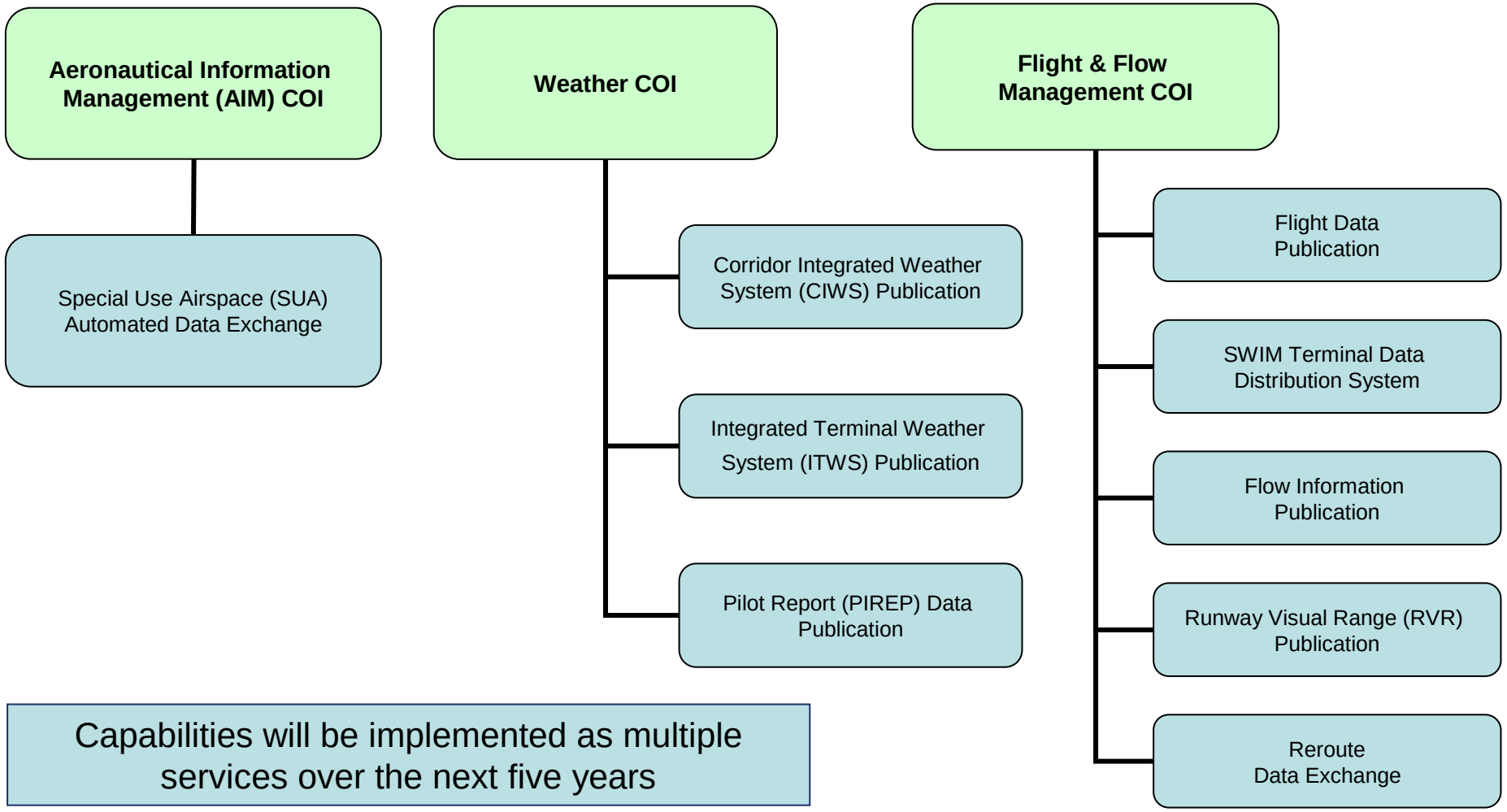
SWIM is *not*:

- A set of avionics equipment
- A substitute for NAS modernization programs
- A telecom program

Conceptual Overview



SWIM Segment 1 Capabilities



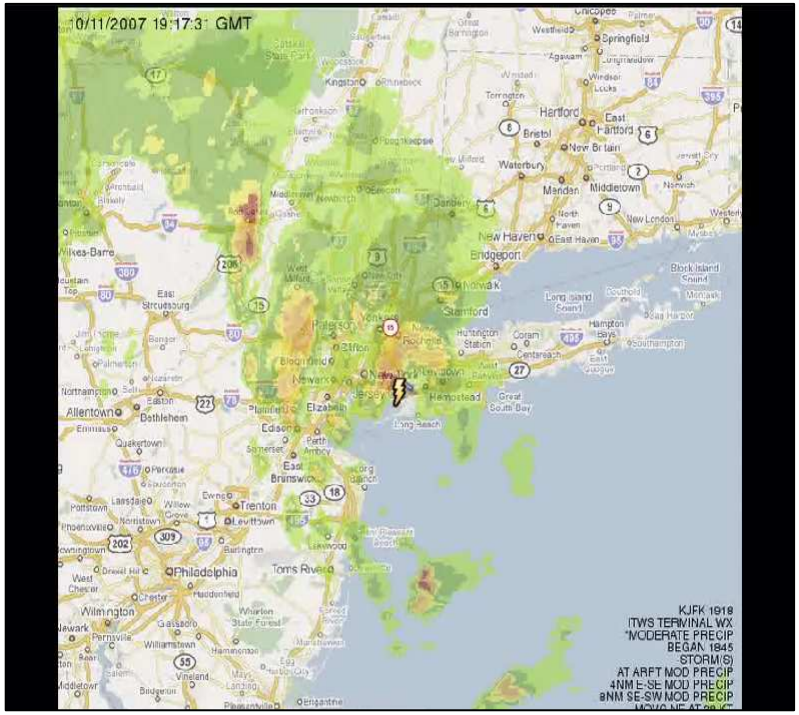
Capabilities will be implemented as multiple services over the next five years

FY09-10 Accomplishments

- Integrated Terminal Weather System (ITWS) Publication prototype service subscribed to by UPS, Harris, DoD, and FedEx
- Trained developers from SWIM Implementing Programs (SIPs) on Progress FUSE Middleware. SIPs have started software development
- Conducting Service Oriented Architecture (SOA) suitability assessments of other FAA programs
- Finishing development of the Airspace Information Management (AIM) portion of the Special Use Airspace (SUA) Automated Data Exchange capability
- Developing Corridor Integrated Weather System (CIWS) Publication prototype service
- SWIM COTS Repository operational
- Released the SWIM Segment 2 Technical Overview and draft Final Program Requirements
- Met with SESAR JU to discuss commonality and interoperability between future SWIM environments

Screenshots of Prototype Developments

ITWS SWIM-compliant data overlaid on a Google map



ITWS-ME v1.0

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Next Steps for FY10

- Provide SWIM-compliant information to more external users/agencies/aircraft
- Procure and start operating SWIM service registry v2.0
- Deploy AIM Special Use Airspace Automated Data Exchange

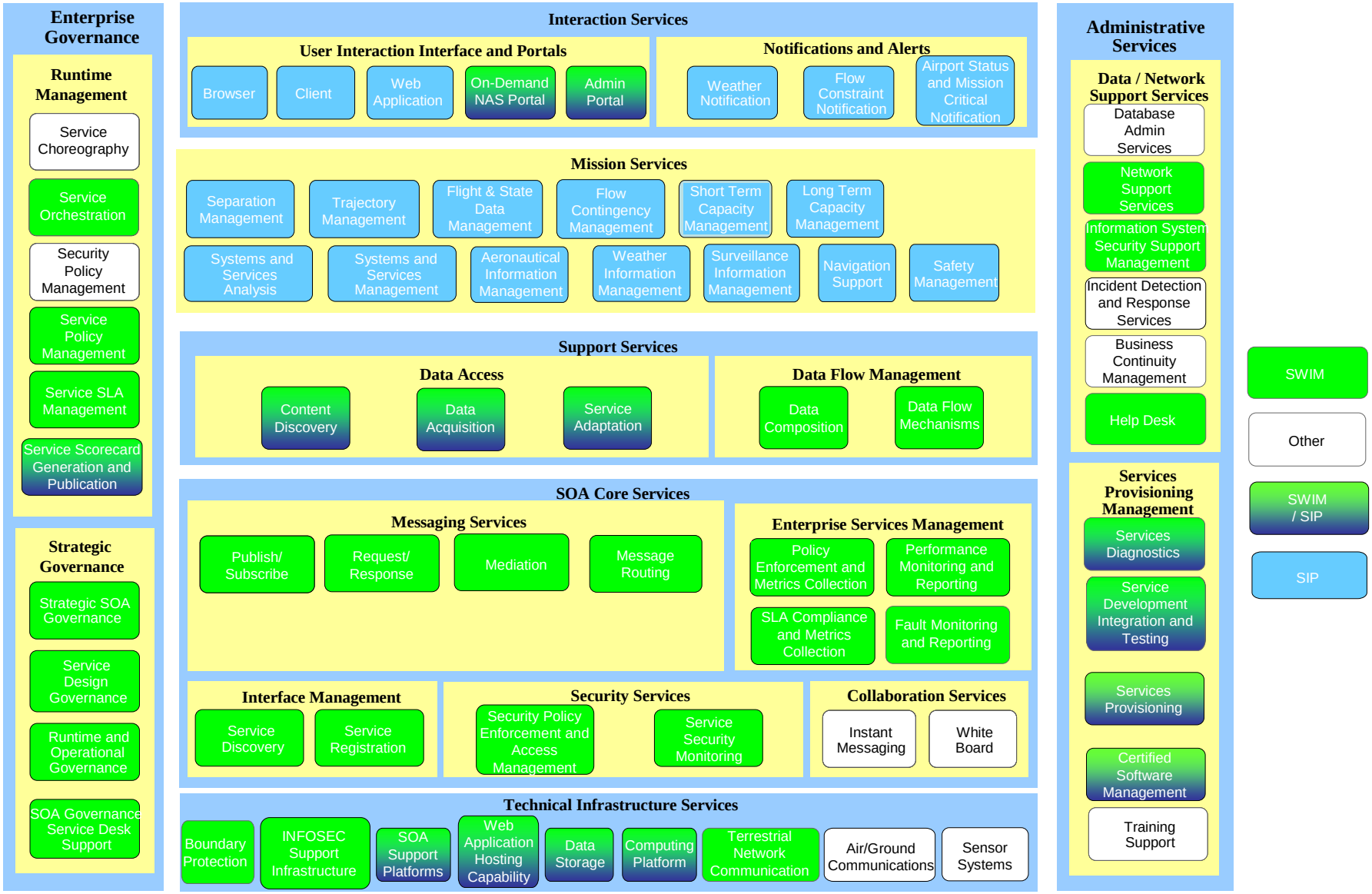
Publisher Requirements for SWIM-Compliance

- **Use of FUSE Software**
  - SOAP Message Processing
  - Java Message Service (JMS) Provider Standardization (Apache Active MQ)
- **Supported Message Formats and Transports**
  - SOAP-over-HyperText Transfer Protocol (HTTP)/HyperText Transfer Protocol Secure (HTTPS)
  - eXtensible Mark-up Language (XML)-over-HTTP/HTTPS
  - SOAP-over-JMS
  - XML-over-JMS
- **SOAP Attachments**
  - Message Transmission Optimization Mechanism
- **JMS Message Type - Text message**
- **Registry / Repository**
  - Discoverability – Web Services Description Language (WSDL)
  - Categorization – SWIM Taxonomy
- **Service Management – Java Management Extensions (JMX)**

Beyond 2010

- **Building SWIM Segment 2**
  - Support data exchange needs of NextGen
  - Build on Segment 1 Governance, for all NAS programs that score high on the SOA Suitability Checklist
  - Expand SWIM infrastructure to include additional Enterprise Service Management, Security, other SOA infrastructure services, and Core services that were delegated to the SIPs in Segment 1

NASEAF SV4 Enterprise Services (SWIM Segment 2)



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SWIM/SWIM-SUIT Interoperability Demo

- **The SWIM/SWIM-SUIT Interoperability demo has been a key step in ensuring future SWIM compatibility between Europe and the US. Benefits have included:**
  - Exploring methods, protocols, techniques, and processes required to enable data exchange between a European SWIM-SUIT prototype and a US SWIM prototype
  - Promoting dialogue between key stakeholders involved with SWIM and SWIM-SUIT implementation
  - Providing a forum for evaluating technologies in a prototype environment
  - Facilitating cooperation and sharing of lessons learned
  - Sharing expectations of requirements

SWIM Web Site

www.swim.gov